L 06139-67 EWT(m) IJP(c)
ACC NR: AP6031170 SOURCE CODE: UR/0361/66/000/002/0003/0015

AUTHOR: Nemenov, L. M.; Anisimov, O. K.; Arzumanov, A. A.; Golovanov, U. N.; Yezerskiy, V. F.; Kravchenko, Ye. T.; Kruglov, V. G.; Laktionov, I. A.; Meshcherov, R. A.; Meshcherova, I. V.; Popov, Yu. S.; Prokof'yev, S. I.; Rybin, S. N.; Fedorov, N. D.

ORG: Institute of Nuclear Physics, AN KazSSR (Institut yadernoy fiziki AN KazSSR)

TITLE: Putting the Kazakhstan cyclotron into operation

SOURCE: AN KazSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 2, 1966, 3-15

TOPIC TAGS: cyclotron, proton accelerator, Mev accelerator, alpha particle / U1502 cyclotron

ABSTRACT: The U-150-2 cyclotron of the Institute of Nuclear Physics of the Academy of Sciences of the Kazak SSR is described. This cyclotron is designed to accelerate protons, deuterons, alpha particles, and multiply charged ions. Energies of 24 Mev are obtained with deuterons. Alpha particles and protons can be accelerated to 48 Mev and 20 Mev, respectively. Sixfold ionized carbon can be accelerated to 140 Mev. The magnetic field in the cyclotron necessary for 20 Mev deuteron production is 14000 oersteds; this is produced by a current of 800 amp. The necessary variation of the magnetic field with radius is obtained by the use of annular shims. The high frequency generator and its alignment is described. The dependence of beam current at various

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ACC NR: AP6031170

final radii is plotted as a function of the potential between the "dees". The authors thank engineers V. A. Borisov, B. L. Vaysman, N. G. Gladenko, senior electronic engineer D. D. Gromov, chiefs of work shifts G. A. Obraztsov and V. E. Oshkin, and chief of service A. I. Tkachev for participation in the work of setting aright the various difficulties involved in setting up the cyclotron. Orig. art. has: 11 figures.

SUB CODE: 18/20 SUBM DATE: none

Card 2/2 mfe

PROKOF'YEV, S. D.

517 Materiol v pomoshch' lektour na temu "Agrotekhnicheskiye priyemy povysheniya uyozhaynosti yagodnykh kul' tur". M., 1954. 15.000 ekz. Bespi. - Na pravakh rukopisi. —[54- 55426]
634.7.

SO: Knizhnaya Letopis, Vol. 1, 1955

PROKOF'EV, S. D.

Let's increase our income from berry gardening. Moskva, Gos. izd-vo selkhoz lit-ry, 1954. 102 p.

1. Berries.
2. Fruit-culture - Russia.

2214 PROKOF'YEV, S.D. AND BLINOV L. F.

Yagodnyye Kustarniki. M., Syel 'Khozgiz, 1954. 110 C. c ill. 20sm. 50.000 EKS. lr. 45k.-
(54-51005) n 634.7

PROKOF'YEV, S. D.

Berries

Selection of berry plants by a method which improves the variety. Sad i og. no. 8, 1952.

9. **Monthly List of Russian Accessions**, Library of Congress, October 1953. Unclassified.

RADCHENKO, O.O.; PYATKOF'YEV, S.L.

Continuous ShOP-1600-K machine for chrome leather polishing and dusting. Kozh.-obuv. prom. 7 no.12:9-12 D '65.
(MIRA 19:2)

PROKOF'YEV, S.N.

Induction coil with two winding and experiments with this coil.
Fiz. v shkole 18 no.2:64-66 Mr-Ap '58. (MIRA 11:2)

1. Chuvashskiy pedagogicheskiy institut, Cheboksary.
(Induction coils)

05218
SOV/142-2-3-26/27

9(3,9), 24(1)

AUTHOR: Sokolova, Ye.S., Candidate of Technical Sciences

TITLE: A Scientific Conference on the Application of Ultrasound in the Investigation of Matter

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Vol 2, Nr 3, p 386 (USSR)

ABSTRACT: From February 10-14, 1959, the Seventh Scientific Conference on the Application of Ultrasound for the Investigation of Matter was convened in Moscow at the Moskovskiy Oblast'noy pedagogicheskiy institut, imeni N.K. Krupskoy (Moscow Oblast Pedagogical Institute, imeni N.K. Krupskaya). About 500 vuz instructors from Moscow, Leningrad, Krasnoyarsk, Kaunas, Stalingrad, and scientists from the German Democratic Republic and Poland participated in the conference work. More than 80 papers were read at the conference. The following sections were organized at this conference: molecular acoustics, industrial application of ultrasound research methods, propagation of ultrasound in solid bodies, demonstration of acoustical phenomena in schools and vuzes. At the first plenary session, the paper of V.F. Nozdrev was read "Physical Principles of Tech-

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nological Application of Low-Amplitude Molecular Acoustics". B.B. Kudryavtsev read his paper "The Application of Ultrasound in Industry". The following papers were read at the plenary session: A.S. Predvoditelev "The Sound Wave Dispersion in Rarefied Gases"; Dr. Rothard, German Democratic Republic, "Ultrasonic Investigation of Silica Gel and Its Derivatives"; M. Kvok, Poland, "The Application of the Molecular Kinematic Theory of Gases to the Problem of Waves with a Limited Amplitude"; M.S. Akulov, "The Theory of Roschell-type Salts", and a paper of Professor F. Kucher, Poland. Research in the field of ultrasound wave propagation in liquids was the subject of the papers of B.B. Kudryavtsev, S.A. Dalyan, L.G. Belinskaya, O.A. Starostina, V.M. Zakurenova, V.D. Kaspar'yants, M.G. Shirkevich, L.F. Vereshchagina, N.L. Bryukhatova, and N.A. Golosova. The paper jointly produced by B.B. Kudryavtsev, V.F. Nozdrev, N.I. Koshkin and V.P. Yakovlev was devoted to the consideration of problems in the development of molecular acoustics. Dr. Rothard delivered a report on the dynamic equation of the state of strongly viscous liquids. The ultrasonic oscillations were subject of the reports of Yu.M. Bystrov, A.N. Trofimov, A.I.

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Ryazanov, L.B. Pirozhnikov, L.F. Lependin, F.L. Lokshin, I.L. Cherchenko and others. The report of L.A. Ol'shanskiy, A.V. Mordvintseva and others dealt with the application of ultrasound in welding. In the sections of acoustic research methods, the papers of the following authors were read: B.I. Kal'yanov, V.P. Yakovlev, A.D. Zipir and V. Kovaleva. These reports dealt with pulse measuring methods of velocity and absorption of ultrasound. The propagation of ultrasound in solid bodies was the subject of the reports of L.G. Merkulov, V.S. Cherkashin, L.A. Yakovlev, A.I. Drokin, A.K. Matveyev and others. In the section dealing with acoustical demonstration at schools and vuzes, the following reports were delivered: M.A. Grabovskiy and V.P. Topolev, "Experimental Demonstration of Ultrasound"; N.I. Mel'nikov, "The Experimental Demonstration of Sound"; N.N. Prokof'yev, "An Acoustic Radiometer for Demonstration Purposes". The annual conference convened at MOPI showed the rising interest in problems of applying ultrasound to the investigation of matter. The number of participants and the number of subjects is rising steadily.

Card 3/3

SUBMITTED: April 13, 1959

GINZBURG, S.K., inzh.; PROKOF'YEV, S.N., inzh.; SHTERNIN, L.A., inzh.

Conditions for the formation of a resistant joint in the friction welding of aluminum with steel. Svar. proizv. no.12:12-14 D '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektrosvarochnogo oborudovaniya.
(Aluminum—Welding)
(Steel—Welding)

S/110/61/000/001/014/023
E194/E455

AUTHORS: Shternin, L.A., Engineer, Prokof'yev, S.N., Engineer, Orlov, Ya.M., Engineer and Kobyl'nitskaya, M.I., Engineer

TITLE: The Introduction of Friction Welding of Copper Current-Conducting Parts

PERIODICAL: Vestnik elektropromyshlennosti, 1961, No.1, pp.44-45

TEXT: This article describes experience of using a friction welding machine type MCT-6 (MST-6) for friction welding of a small copper assembly. In the old method of construction, a copper pin 12 mm diameter was turned down at one end to fit a brass washer and was soldered to a strip of copper 2 mm thick. Friction welding was the most suitable for such parts, as arc welding could not be used. The machine type MST-6 has a motor of 2.8 kW, the spindle is driven at 4000 rpm and an axial force of 50 to 1000 kg can be applied pneumatically. The welding time can be controlled within the range 0.5 to 2.5 sec, and the complete cycle has a duration variable between 5 and 15 sec. The machine automatically loads the pins into the pressure device of the spindle, brings the strip up to the spindle, makes the weld and discharges the welded products.

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E194/E455

The Introduction of Friction Welding of Copper Current-Conducting Parts

The parts are carried on a rotating table with eight positions. Pneumatic drive is used to turn the table. Welding can be effected with very little distortion of the parts. The use of the machine has simplified production of the parts; there is no need to make the brass washers, to roll the parts together or to clean them after soldering. By use of the machine, the standard time for making the parts was reduced from 1.6 to 0.25 hours per hundred. The economy of wages was 6.95 roubles per 100 parts. The properties of the finished parts are improved. It is necessary that the surfaces of all the parts should be equally clean. This is achieved by etching in a mixture of sulphuric and nitric acids, followed by water washing and compressed-air drying. There are 2 figures.

SUBMITTED: June 14, 1960

Card 2/2

AUTHOR: Prokof'yev, S.N. (Cheboksary) 47-58-2-15/30

TITLE: **Experiments With a Two-Winding Induction Coil**
(Induktsionnaya katushka s dvumya obmotkami i opyty s ney)

PERIODICAL: Fizika v Shkole, 1958, Nr 2, pp 64-66 (USSR)

ABSTRACT: The author tells how to demonstrate to pupils an induction coil with 2 windings. Each winding is of a different kind of wire, usually one is of insulated copper wire and the other is of an insulated wire made from an alloy with a high specific resistance. With the aid of galvanometers, it can show that the volume of the inductive current in both windings is different when the magnetic stream is varied. Different electrical problems can also be solved with this coil. There is 1 figure.

ASSOCIATION: Chuvashskiy pedagogicheskiy institut, g. Cheboksary
(The Chuvashskiy Pedagogical Insitute, Cheboksary)

AVAILABLE: Library of Congress

Card 1/1 1. Physics-Study and teaching 2. Induction coils-Study and teaching
3. Electricity-Study and teaching

PROKOF'YEV, S.N.

A makeshift speedometer and experiments with it. Fiz. v shkole 15 no.3:45-47 My-Je '55. (MLRA 8:6)

1. Chuvashskiy pedagogicheskiy institut (G. Cheboksary)
(Speed-indicators)

VASIONIS, G.; PROKOF'YEV, S.

The MSTA-31 automatic welder. Avtom. svar. 18 no.3:74 Mr '65.
(MIRA 18:6)

PROKOF'YEV, S.

Communist Youth League flame. Kryl. rod. 13 no.3:20 Mr '62.
(MIRA 18:5)

1.2310 2408 1573

28984 S/135/61/000/011/006/007
A006/A101

AUTHORS: Shternin, L. A., Prokof'yev, S. N., Engineers

TITLE: Friction welding of aluminum with steel and copper

PERIODICAL: Svarochnoye proizvodstvo, no. 11, 1961, 30-32

TEXT: Information is given on results of experiments made for the purpose of determining the basic parameters of conditions for friction welding АД-1 (AD-1) aluminum rods, 30, 40, and 50 mm in diameter with grade СТ.3 (St.3) steel and M1 copper. Aluminum was friction welded with steel on a МСТ-31 (MST-31) machine; the rotation of the welded blanks varied from 230 to 1,000rpm; axial forces of up to 20,000 kg were developed. The aluminum blank was clamped in a steel mandrel eliminating the heat and preventing its free deformation during welding. The blank protruded from the mandrel to a given length depending on the diameter of the specimen. The quality of weld joints was determined from the bending angle, when the welded specimens were subjected to tensile and shearing tests. It was found that the speed of relative rotation affected considerably the quality of welds; it should not be less than 760 rpm when welding 30 mm diameter blanks. Specimens of 40 mm diameter were tested, to

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Friction welding of aluminum with steel ...

determine the dependence of the bending angle of the welded joint on the specific pressure at heating and peening and rotation speed of 760 rpm. Specific heating pressure should not be below 5 kg/mm^2. Tests with 30 mm diameter specimens show that at this pressure the specific peening pressure does not affect the weld quality, which remain satisfactory at both constant or increased pressure. Tests with 50 mm diameter steel specimens welded with Al did not show fracture resistance of all the specimens at 180° bending; however, in a number of cases the results were satisfactory. Ultimate strength of the butt metal was 10 kg/mm^2 against 8.5 kg/mm^2 of the base metal; it was 7.5 - 8.2 kg/mm^2 in the shearing tests. Microhardness corresponded to that of the base metal. Friction welding of 20 mm diameter aluminum with copper was also performed on a MST-31 machine. To remove case hardness the copper surface was machined and annealed at 600 - 700°C for 30 minutes. Tests showed that in all cases, excepted when the specimens were welded at 2 kg/mm^2 specific heating pressure, the failure occurred in the aluminum remote from the butt. It was found that welds produced by the described method show satisfactory qualities. The main features distinguishing friction welding of aluminum with copper or steel from other metal combinations are: 1) the aluminum butts must be carefully cleaned; 2) the blanks should be fastened with steel mandrels; 3) the gauged length of the aluminum blank

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Friction welding of aluminum with steel ...

must be carefully observed; 4) copper blanks must be machined, annealed and cleaned; 5) high peening pressure during the welding of copper with aluminum promotes apparently the destruction and removal of brittle components, thus raising the quality of welds. There are 4 tables and 3 figures.

ASSOCIATION: VNIIESO

Card 3/3

SHTERNIN, L.A., inzh.; PROKOF'YEV, S.N., inzh.; ORLOV, Ya.M., inzh.; KOBYL'NITSKAYA, M.I., inzh.

Friction welding of conducting copper parts. Vest. elektroprom. 32 no.1:44-45 Ja '61. (MIRA 14:3)
(Electric conductors--Welding)

PETRUSHOV, Azriel' Markovich; BUDARIN, V.A., nauchnyy red.; PROKOF'YEV, S.P., red.

[Situation of peasants in capitalist countries after the Second World War] Polozhenie krest'ianstva v kapitalisticheskikh stranakh posle Vtoroi Mirovoi voiny. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1959. 56 p. (MIRA 12:12)
(Agriculture--Economic aspects) (Peasantry)

KUZ'MINOV, Ivan Ivanovich; PROKOF'YEV, S.P., red.; NAUMOV, K.M., tekhn.red.

[Impoverishment of the workers under capitalism] Obnishchanie trudiashchikhsia pri kapitalizme. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1960. 335 p. (MIRA 13:2)
(Labor and laboring classes)

KOZLOV, Genrikh Abramovich, prof.; SHIRINSKIY, Ivan Dmitriyevich, dotsent; KONAKOV, Dmitriy Maksimovich, prof.; MOROZOV, Aleksandr Vasil'yevich, dotsent; BELYAYEVA, Zoya Nikolayevna, kand.ekonom.nauk; KORYAGIN, A.G., red.; PROKOF'YEV, S.P., red.; NAUMOV, K.M., tekhn.red.

[Capitalist methods of production] Kapitalisticheskii sposob proizvodstva. Moskva, Izd-vo VPSh i AON pri TsK KPSS. Pt.1. 1959. 237 p. (MIRA 12:6)

1. Kommunisticheskaya partiya Sovetskogo Soyuza. Vysshaya partiynaya shkola. Kafedra politicheskoy ekonomii.
(Economics) (Capitalism)

RUMYANTSEV, Aleksey Matveyevich; PROKOF'YEV, S.P., red.; NAUMOV, K.M., tekhn.red.

[The subject of political economy] O predmete politicheskoi ekonomii. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1960. 124 p. (MIRA 13:10)

(Economics)

SDOBNOV, Semen Ivanovich, kand.ekonom.nauk; MOISEYEV, M.I., nauchnyy red.; PROKOF'YEV, S.P., red.

[Socialist agriculture] Sotsialisticheskaia sistema sel'skogo khoziaistva. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1959. 82 p. (MIRA 12:11)

(Agriculture)

PROKOFIEV, S. P.

26558 Lesnyye zashitnyye polosy na yagodnykh plantatsiyau. Sad i ogorod, 1949, No. 8, s. 14-17.

SO: LETOPIS' NO. 35, 1949

PLOTNIKOV, Kirill Nikanorovich, prof.; PROKOF'YEV, S.P., red.; NAUMOV, K.M., tekhn.red.

[Finance and credit in the U.S.S.R.] Finansy i kredit v SSSR. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1959. 202 p. (MIRA 12:8)

(Russia--Finance)

PROKOF'YEV, S.S.

Role of condensate waters in the formation of karst caves. Peshchery no.4:35-38 '64. (MIRA 18:5)

1. Adlerskaya kompleksnaya stantsiya Laboratorii gidrogeologicheskikh problem imeni Savarenskogo.

PROKOF'YEV, T. I., Candidate Biol Sci (diss) -- "A study of the technology of producing intestinal vaccines by the hypogeal method". Gor'kiy, 1959. 13 pp (Gor'kiy Med Inst im S. M. Kirov), 200 copies (KL, No 23, 1959, 163)

PROKOF'YEV, V.

"Atomic and molecular spectroscopy" by M.A. El'iashevich. Reviewed by V. Prokof'ev. Opt. i spektr. 14 no.6:839-840 Je '63. (MIRA 16:8)

(Spectrum analysis)
(El'iashevich, M.A.)

PROKOF'YEV, V.

Provide the enterprises with designing and technological bureaus. Mest.prom.i khud.promys. 3 no.12:10-11 D '62. (MIRA 16:2)

1. Nachal'nik konstruktorsko-tekhnologicheskogo byuro Stavropol'skogo krayevogo bytupravleniya.
(Stavropol' Province--Service industries)

PROKOF'YEV, V. (g. Stavropol')

In two basic directions. Prom. koop. 12 no.10:31 O '58.
(MIRA 11:10)

1. Glavnyy inzhener Stavropol'skogo krayprombsoveta.
(Stavropol' Province--Chemical industries)

PROKOF'YEV, V.

PBOKOF'YEV, V.

Pogruzheniye Dvukhmernykh Prostranstv Normal'noy Proyektivnoy Svyaznosti V Trekhmernoye Proyektivnoye Prostranstv. Dan, 36 (1942), 95-97.

SO: Mathematics in the USSR, 1917- 1947
edited by Kurosh, A. G.,
Markushevich, A. I.,
Rashevskiy, P. K.
Moscow - Leningrad, 1948.

PROKOF'YEV, V.

AID P - 767

Subject : USSR/Miscellaneous

Card 1/1 Pub. 135 - 13/15

Author : Nikolayeva, N.

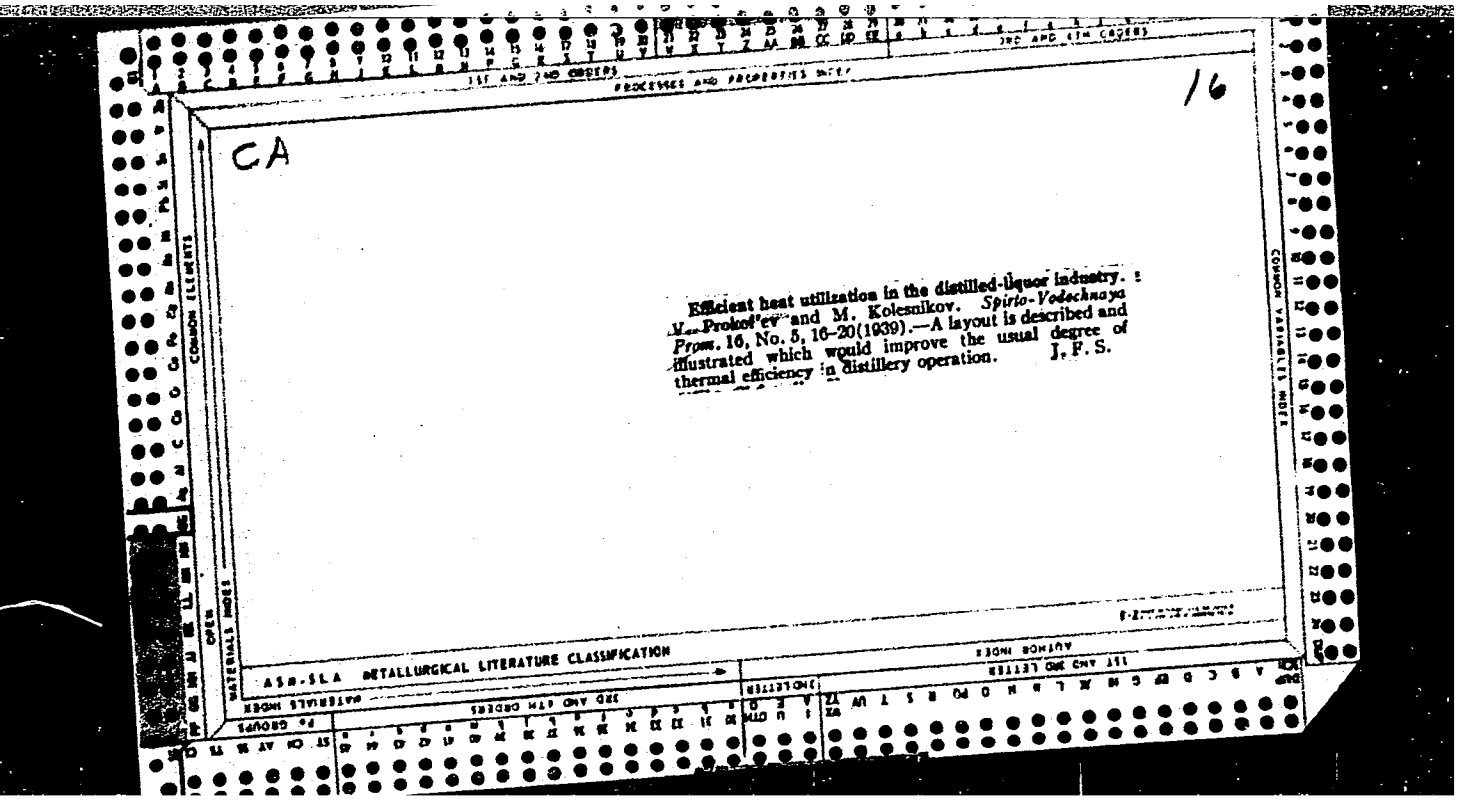
Title : Religion, the Foe of Science and Progress

Periodical : Vest. vozd. flota, 11, 87-89, N 1954

Abstract : This is a review of a book of antireligious propaganda written by Prokof'yev, V., Religion the Foe of Science and Progress, Gospolitizdat, 1954.

Institution : None

Submitted : No date



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Efficient heat utilization in the distilled-liquor industry. I. Prokof'ev and M. Kolesnikov. *Spirto-Vodochnaya Prom.* 16, No. 5, 16–20(1939).—A layout is described and illustrated which would improve the usual degree of thermal efficiency in distillery operation. J. F. S.

PROKOF'YEV, V.A.; YERMAKOVA, V.I.

Boron content in the shells of Paleozoic brachiopods. Dokl. AN SSSR 149 no.5:1170-1173 Ap '63. (MIRA 16:5)

1. Predstavleno akademikom N.M.Strakhovym.
(Boron) (Brachiopoda, Fossil)

KARABUT, V.P.; PROKOF'YEV, V.A.

Tool for cutting cast iron sewage pipes [Suggested by V.P. Karabut, V.A.Prokof'ev]. Rats. i izobr. predl. v strd. no.6: 139 '58. (MIRA 11:10)

(Pipe cutting)

[illegible], V. A. --

"Carboniferous Atypri's of the [illegible] Moller."
Chtd Biol Sci, Paleontological Inst, Ac Sci USSR, Theses, 1955.
(Mikhail, Jan 56)

Survey of Scientific and Technical Dissertations Defended ...
USSR Higher Educational Institutions (10)

SO: Sum. No. 481, 5 Aug 55

AUTHOR: Prokof'yev, V.A. SOV/11-59-2-10/14

TITLE: On the Systematic Composition and the Stratigraphic Importance of the Upper-Devonian Pelecypoda of the Central Part of the Volga-Ural Area (O sistematicheskom sostave i stratigraficheskom znachenii verkhnedevonskikh pelletsipod tsentral'noy chasti Volgo-Ural'skoy oblasti)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, 1959, Nr 2, pp 119-122 (USSR)

ABSTRACT: The Pelecypoda fossils were found in large quantities in the Upper-Devonian deposits of the central part of the Volga-Ural area. A study of these fossils and of gradually appearing new species of the same series permitted a more precise stratification of these deposits. Identical fossils found both in this region and in the Ural synclinal area showed that there was a direct link between these two areas. Moreover, a study of the systematic composition and vertical distribution of Pelecypoda showed that a series of fossils found in the Middle-Frasnian deposits were identical with those found in corresponding layers of the Naples Fauna of North America. Such a wide

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On the Systematic Composition and the Stratigraphic Importance of the Upper-Devonian Pelecypoda of the Central Part of the Volga-Ural Area

distribution of Pelecypoda indicated that the basins of both continents were linked during the Devonian period. There are 7 references, 6 of which are Soviet and 1 American.

ASSOCIATION: Vsesoyuznyy n.-i. geologorazvedochnyy neftyanoy institut (VNIIGNI), Moskva (The All-Union Scientific Research Geological Prospecting Petroleum Institute (VNIGNI), Moscow

SUBMITTED: December 31, 1957

PROKOF'YEV, V.A. [Prakof'eu, V.A.]

Pelecypoda of the upper Devonian in White Russia. Vestsi AN BSSR. Ser.fiz.-tekh.nav. no.3:115-119 '60. (MIRA 13:9)
(White Russia--Lamellibranchiata, Fossil)

PROKOF'YEV, V.A.

Upper Devonian Pelecypoda in the central Volga-Ural region. Izv. Kazan. fil. AN SSSR. Ser. geol. nauk no. 7:47-80 '59. (MIRA 14:4)
(Volga-Ural region—Lamellibranchiata)

PLOKOTNYY, V. A. Cand Phys-Mo. Math. Sci

"Stationary Uniform Movement of Gas Taking Into Account Radiation." Sb. Sc Art, Inst of Mechanics, Acad Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 470, 2 May 55.

PROKOF'YEV, V. A.

Among the papers presented by the First All-Union Conference on Aerohydrodynamics (8-13 Dec 1952) convened by the Institute of Mechanics, Academy of Sciences USSR, was:

"One-Dimensional Stationary Motion of a Radiation Non-Viscous Gas Taking Into Account Ionization" by Prokof'yev, V. A.

SO: Izvestiya AN USSR, Otdeleniye Tekhnicheskikh Nauk, No. 6, Moscow, June 1953, (W-30662, 12 July 1954)

PROKOF'YEV, V.A.

24-7-12/28

AUTHOR: Prokof'ev, V. A. (Moscow).

TITLE: Influence of radiation on the propagation of small disturbances in a viscous heat conducting liquid (Hydrodynamic theory). (Vliyaniye izlucheniya na rasprostraneniye malykh vozmushcheniy v vyazkoy i teploprovodnoy zhidkosti (gidrodinamicheskaya teoriya).

PERIODICAL: "Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk" (Bulletin of the Ac.Sc., Technical Sciences Section), 1957, No.7, pp.94-102 (U.S.S.R.)

ABSTRACT: The hydrodynamic theory is considered of the propagation of small plane disturbances taking into consideration viscosity, thermal conductivity and radiational heat transfer. The equation of state of the medium is assumed in its most general form and the radiation caused heat inflow is taken into consideration on the basis of the equations of radiation transfer. It is established that the propagation of forced waves is described by means of a bicubic characteristic equation, the roots of which correspond to three simultaneously occurring types of waves, acoustic (pressure) waves and two types of thermal waves, defined by four dimensionless numbers and also by the ratio of the specific thermal capacities. Reviewing briefly work in this

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Influence of radiation on the propagation of small disturbances in a viscous heat conducting liquid. (Cont.)
24-7-12/28

field it is concluded that the present state of the hydrodynamic theory of propagation of infinitely small disturbances does not permit a final conclusion on the role of the radiation heat transfer even in cases in which the medium is in its normal state. In this paper an attempt is made to investigate this problem, taking into consideration more accurately radiation heat transfer, namely, by considering not only the heat radiation but also the absorption of radiated energy. In para.1 the fundamental equations are formulated and the system of equations (1.11) is obtained for calculating the heat flow along the Ox axis, the increase in temperature and the increase in pressure. In para.2 the forced waves and the characteristic frequency equations are considered, whilst in para.3 analogy criteria are studied.

2/2 There are 8 references, known of which is Slavic.

SUBMITTED: February 18, 1957.

AVAILABLE:

PROKOF'YEV, V.A.

Taking into account radiation in hydrodynamic theory of propagation of plane forced waves of infinitesimal amplitudes. Vest. Mosk. un. Ser. mat. mekh. astron., fiz., khim. 12 no. 6:7-16 '57. (MIRA 11:10)

1. Kafedra aeromekhaniki i gazovoy dinamiki Moskovskogo gosudarstvennogo universiteta.
(Sound waves)

AUTHOR: Prokof'yev, V.A. (Moscow) 40-21-6-6/18

TITLE: Weak Waves in a Compressible Liquid Under the Effect of Radiation (Slabyye volny v szhimayemoy zhidkosti s uchetom izlucheniya)

PERIODICAL: Prikladnaya Matematika i Mekhanika, 1957, Vol 21, Nr 6, pp 775-782 (USSR)

ABSTRACT: In the classical theory of wave propagation the influence of the radiation on the propagation of waves of infinitely small amplitude was estimated only under very restrictive suppositions. The author now derives the equations for the radiation in the moving medium from the hydrodynamic equations and thereby considers the heat flow on the basis of the radiation. Furthermore the influence of the internal energy on the mechanic radiation effects is investigated. In the represented hydrodynamic theory of propagation of plane waves the disturbances are linearized and the system is correspondingly approximatively solved. Characteristic equations are obtained from which he calculates the damping and the velocity of the propagation of the forced as well as of the free waves in a resting medium under very general suppositions on the proper-

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Weak Waves in a Compressible Liquid Under the Effect of Radiation 40-21-6-6/18

ties of this medium in hydrodynamic as well as in optic respect. In some examples the damping- and radiation characteristic is calculated. There are 3 references, 2 of which are Soviet, and 1 English.

SUBMITTED: March 22, 1957

AVAILABLE: Library of Congress

1. Wave propagation-Theory 2. Thermodynamics 3. Hydrodynamics

Card 2/2

PROKOFYEV, V. A.

"The Influence of Radiation on the Propagation of Infinitely Small Disturbances in Liquids and Gases."

paper presented at 4th All-Union Conf. on Acoustics, Moscow, 26 May - 2 Jun 59.

24(8)
AUTHOR: Prokof'yev, V.A. SOV/55-58-2-8/35

TITLE: The Averaging of the Equation for the Transmission of the Radiant Energy With Respect to Directions (Osredneniye po napravleniyam uravneniya perenosa luchistoy energii)

PERIODICAL: Vestnik Moskovskogo Universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 2, pp 57-66 (USSR)

ABSTRACT: The author investigates an instationary radiation field in a movable medium under consideration of the radiation pressure and of the internal radiated energy. He applies an approximative method which has been already used in astrophysics by Schuster [Ref 5] and generally by Ye.S. Kuznetsov [Ref 7] and which essentially consists in the fact that one changes over from the intensities to magnitudes independent on the direction which describe the field in the large. The passage is carried out by averaging. There are 11 references, 5 of which are Soviet, 2 English, 2 German and 2 American.

ASSOCIATION: Kafedra aeromekhaniki i gazovoy dinamiki (Chair of Aeromechanics and Gasdynamics) [Moscow Univ.]

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24(8) SOV/55-58-3-6/30

AUTHOR: Prokof'yev, V.A.

TITLE: Transmission Equations of the Integral Functions of a Radiation Field (Uravneniya perenosa integral'nykh funktsiy radiatsionnogo polya)

PERIODICAL: Vestnik Moskovskogo universiteta,Seriya matematiki, mekhaniki astronomii, fiziki, khimii ,1958,Nr 3,pp 39-46 (USSR)

ABSTRACT: The present paper is a continuation of the preceding publication of the author [Ref 1] in which he considers the transition from the transmission equation of the radiation to the equations of the fluxes independent of the direction. In the case of a planely laminated medium he now investigates more general transformation cases of the semiintegral and integral functions (all the functions occurring in the transmission equation only depend on one coordinate). § 1. Semispherical integral characteristics of the radiation field § 2. Approximative equations of the complete integral characteristics of the radiation field.

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Transmission Equations of the Integral Functions of a Radiation Field SOV/55-58-3-6/30

There are 2 Soviet references.

ASSOCIATION: Kafedra aeromekhaniki i gazovoy dinamiki (Chair of Aeromechanics and Gas Dynamics)

SUBMITTED: October 17, 1957

Card 2/2

SOV/24-58-12-3/27

AUTHOR: Prokof'yev, V.A.

TITLE: Absorption and Dispersion of Weak Forced Waves of Very Small and Very Large Frequency Under the Action of Radiational Heat Transfer (Pogloshcheniye i dispersiya slabykh vynuzhdennykh voln ochen' maloy i ochen' bol'shoy chastoty pod vliyaniyem radiatsionnogo perenosa tepla)

PERIODICAL: Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 12, pp 15-23 (USSR)

ABSTRACT: The previous paper in this series was published in Izvestiya Akademii Nauk, Otdeleniye tekhnicheskikh nauk, 1957, Nr 7. It was shown there that the propagation of forced plane infinitesimal waves in a liquid or gas is described by a bicubic equation when viscosity, thermal conductivity and radiational heat transfer are taken into account. Thus, corresponding to the three pairs of roots, there should be a simultaneous excitation of three, generally speaking different, types of waves, while when radiation is completely neglected, or only Newton's law is taken into account, only two types of waves are excited. On taking into account radiation effects one finds an additional type of waves.

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Absorption and Dispersion of Weak Forced Waves of Very Small and Very Large Frequency Under the Action of Radiational Heat Transfer

The excitation of the three types of waves takes place simultaneously so that an observer may not be able to separate them out. The present paper is concerned with the cases where the three types of waves have different attenuation coefficients and different speeds of propagation, so that these properties may be used to separate them out. The three types of waves are described by the roots of Eq.1.1 . The first type of waves are low-frequency acoustic and pressure waves which are damped by viscosity, thermal conductivity and radiation losses. Expressions are derived for the attenuation coefficients, acoustic absorption coefficients and speeds of propagation in this case.

SOV/24-58-12-3/27

Absorption and Dispersion of Weak Forced Waves of Very Small and Very Large Frequency Under the Action of Radiational Heat Transfer

The second and third type of waves are thermal waves. There are 6 references of which 4 are Soviet and 2 English.

SUBMITTED: 18th February 1957.

Card 3/3

PROKOF'YEV, V.A.

Translation equations of the integral functions of a radiation field. Vest.Mosk.un.Ser.mat.,mekh.,astron.,fiz.khim. 13 no.3: 39-45 '58. (MIRA 12:4)

1. Kafedra aeromekhaniki i gazovoy dinamiki Moskovskogo universiteta.

(Radiation) (Differential equations, Partial)

PROKOF'YEV, V. A. (Moscow)

"(Infinitesimally) Small Waves in Radiating Gases."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

S/055/60/000/01/06/009

AUTHOR: Prokof'yev, V.A.

TITLE: On the Velocity of the Propagation of Small Disturbances and the Existence of Weak Shock Waves in the Radiating Gas Taking Into Consideration the Pressure of Heat Radiation

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya I, matematika, mekhanika, 1960, No.1, pp.43-59

TEXT: Starting from the hydrodynamic Navier-Stokes equation, and under consideration of the mechanical action of the radiation of equilibrium, the author considers the propagation of plane harmonic weak disturbances shock and thermic waves) in a medium in a resting state of equilibrium, the thermic and caloric state of which are given in a very general form. For the adiabatic sound velocity the author obtains a formula which considers the radiation pressure. A characteristic (frequency) equation of Kirchhoff's type is obtained with the aid of which the velocity and damping of small disturbances under the influence of the tenacity and thermal conductivity can be determined. The author restricts himself to non-relativistic relations. There are 6 figures and 7 references: 2 Soviet, 1 German, 3 English and 1 American.

ASSOCIATION: Kafedra aeromakhaniki i gazovoy dinamiki (Department of Aeromechanics and Gas Dynamics)

SUBMITTED: May 21, 1958

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PROKOF'YEV, V.A.

81830

S/179/60/000/02/003/032
E031/E213

10.2000

AUTHOR: Prokof'yev, V. A., (Moscow)

TITLE: The Propagation of Forced Plane Compression Waves of Small Amplitude in a Viscous Gas, Taking Into Account the Natural Radiation Field

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, Nr 2, pp 17-33 (USSR)

ABSTRACT: A theory of wave motion in a radiation field is presented, based on the linearized hydrodynamic equations of a radiating fluid and the radiation field equations, taking into account the spectral and angular distribution of the intensities and the finiteness of the velocity of the radiation. Thermal emission and absorption, as well as the mechanical action of radiation and the internal radiation energy, are considered. The radiation is assumed to satisfy Kirchoff's law. The characteristic (frequency) Eq (1.1) is obtained by the method of Ref 5 in a non-dimensional form. This equation describes the motion, in an unbounded, viscous, heat-conducting and radiating fluid, of plane, forced, stationary, harmonic

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S/179/60/000/02/003/032
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The Propagation of Forced Plane Compression Waves of Small Amplitude in a Viscous Gas, Taking Into Account the Natural Radiation Field

waves of infinitely small amplitude, originating in externally maintained harmonic disturbances at the origin of the co-ordinates. The significance of the various quantities in the equation is discussed (Eqs(1.2) to (1.8)). The frequency is considered in a number of limiting cases (Eqs (2.1) to (2.7)). The main part of the paper is taken up with a discussion of nearly-adiabatic (section 3) and nearly-isothermal (section 4) waves. For zero wave energy dissipation (adiabatic propagation), the characteristic equation has a unique root corresponding to undamped waves moving with the Laplace velocity of sound (Eqs (3.1) to (3.5)). Nearly adiabatic waves travel at a velocity which is only slightly different from that of adiabatic waves (Eqs (3.6) to (3.7)). The velocity of compression waves is only slightly different from (a) the second adiabatic velocity of sound (Eqs (3.8) to (3.9)), and (b) the adiabatic velocity of sound in a medium filled with gas and black radiation (Eq (3.10)). The conditions for the propagation of waves at the first and second adiabatic velocities

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The Propagation of Forced Plane Compression Waves of Small Amplitude in a Viscous Gas, Taking Into Account the Natural Radiation Field

are discussed, and the existence of the two velocities is explained. The special cases of high-frequency and low-frequency waves are considered. The conditions for the propagation of nearly isothermal waves are discussed (section 4). These include the requirement that the Reynolds number must be sufficiently large. Motion at large and small, but not infinitely small, Buger number is analysed (Section 5). The conclusions of the paper are summarized as follows: Weak waves are "almost adiabatic" sound waves. Their damping coefficient over unit length is a monotonic increasing function of the frequency and is defined for small frequencies by the radiative heat transfer and for moderate frequencies by the action of all three dissipative processes: viscosity, heat conductivity and radiative heat transfer. High frequencies are damped by viscosity and heat conductivity, while the relative importance of radiative heat transfer tends to zero. Five parameters are important in the discussion. These are X - the reci-

Card 3/4 procal of the generalized Reynolds number, Z - the

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The Propagation of Forced Plane Compression Waves of Small Amplitude in a Viscous Gas, Taking Into Account the Natural Radiation Field

reciprocal of the Boltzmann number, ξ - the ratio of the radiation pressure to the gas pressure in an undisturbed medium, c^0 - the ratio of the adiabatic velocity of sound to the velocity of light, and $\theta = k_0 T_0 \sigma / \gamma p_0 h_1 h_4$. At high temperatures, when Z is of the order of unity, and X, θ are small, the velocity of the waves of very high and very low frequencies is near the adiabatic velocity of sound. If Z is large for small values of X, θ, ξ, c^0, the velocity monotonically decreases from the adiabatic velocity for small frequencies to the isothermal velocity for moderate frequencies. Waves of higher frequency are isothermal sound waves. If Z is large, ξ negligibly small and X, θ small, waves of low frequency are propagated with the "low-frequency adiabatic velocity of sound", and waves of high frequency with the "high-frequency velocity of sound". There are 8 references, 3 of which are English and 5 Soviet.

SUBMITTED: February 18, 1957

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80858

S/055/60/000/02/05/009

10.2000

AUTHOR: Prokof'yev, V.A.

TITLE: A Theory of Propagation of Forced Harmonic Shock Waves of Small Amplitude Which Bases on the Eulerian Gas Dynamic Equations and Considers the Heat Transmission by Radiation. I. Large and Small Wave Numbers of Boltzmann and Bouguer

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya I, matematika, mekhanika, 1960, No. 2, pp. 33-52

TEXT: The paper is divided into two parts and joins the earlier paper of the author (Ref.1). The present note is the first part and the second part will be published in Vestnik Moskovskogo universiteta. Seriya I, matematika, mekhanika, 1960, No. 3. In (Ref. 1) it was shown that the problem of motion of a simple harmonic forced wave of infinitely small amplitude in an ideal compressible fluid, under consideration of the heat transferred by radiation, leads to the characteristic equation.

$$(1.1) \qquad (ivZ\kappa^{-1}-v^2)m^4+(1-v^2+ivZ)m^2+1 = 0,$$

where Z and v are inversely proportional to the "wave numbers" Bo and Bu of Boltzmann and Bouguer. In the present paper the author considers a number of limit cases (small Bo, small Bu, etc.). The characteristic equation is solved by series arrangements and leads to approximate expressions for the

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A Theory of Propagation of Forced Harmonic Shock Waves of Small Amplitude Which Bases on the Eulerian Gas Dynamic Equations and Considers the Heat Transmission by Radiation. I. Large and Small Wave Numbers of Boltzmann and Bouguer S/055/60/000/02/05/009

coefficient of absorption and for the velocity of waves. Especially it is pointed out that these are only limit cases which are not adequate to the general case. At the other hand, for certain intervals of v and Z the problem turns exactly on these limit cases. The author gives the intervals in question and therewith the limits of application of the classical theory of consideration of radiation for acoustic waves. There are 6 figures and 6 references: 2 Soviet, 1 French and 3 English.

ASSOCIATION: Kafedra aeromekhaniki i gazovoy dinamiki (Department of Aeromechanics and Gas Dynamics)

SUBMITTED: March 2, 1959

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80868

S/055/60/000/03/04/010

10.2000

AUTHOR: Prokof'yev, V.A.

TITLE: The Theory of Propagation of Forced Harmonic Pressure Waves Basing on the Gas Dynamic Eulerian Equations and Considering the Heat Transfer Caused by Radiation. II. Absorption and Dispersion of Waves

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya I, matematika, mekhanika, 1960, No. 3, pp. 31-48

TEXT: In the first part of the paper (see Vestnik Moskovskogo universiteta. Seriya I, matematika, mekhanika, 1960, No. 2) the author investigated the motion of a harmonic pressure wave if the frequency of the oscillation and the state of the medium correspond to small or large values of the numbers of Boltzmann and Bouguer. In the present second part the author considers the general case of arbitrary numbers Bo and Bu and gives the general course of the wave motion in different media in dependence on the frequency of oscillation. In the first part the roots of the equations could be developed in a small parameter, while in the present case they must be calculated numerically. The calculation was carried out for the value $\varkappa = 5/3$ and the results are given in several graphs. The change of the coefficient of absorption, the ratio of the phase velocity of the wave to the adiabatic

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The Theory of Propagation of Forced Harmonic Pressure Waves Basing on the Gas Dynamic Eulerian Equations and Considering the Heat Transfer Caused by Radiation. II. Absorption and Dispersion of Waves

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sound velocity, and the course of the group velocity are investigated in detail. The results are compared with the classical theory and with (Ref.1). § 1. Absorption of pressure waves; § 2. Velocity of pressure waves; § 3. Domain of Application of the approximation formulas. There are 16 figures and 2 references: 1 Soviet and 1 American.

ASSOCIATION: Kafedra aeromekhaniki i gazovoy dinamiki (Department of Aeromechanics and Gas Dynamics)

SUBMITTED: March 2, 1959

Card 2/2

PROKOF'YEV, V.N.

PHASE I BOOK EXPLOITATION SOV/5724

Moscow. Universitet.

Voprosy mekhaniki; sbornik statey. vyp. 193. (Problems of Mechanics; Collection of Articles. no. 193) [Moscow] Izd-vo Mos. univ., 1961. 169 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova.

Ed.: L. N. Sretenskiy, Corresponding Member, Academy of Sciences USSR. Ed. (This vol.): I. Z. Pirogov; Tech. Ed.: G. I. Georgiyeva.

PURPOSE: This book is intended for engineers and scientific workers interested in the mechanics of materials, fluid dynamics, and radiation.

COVERAGE: The book contains articles on problems of algebra, nonlinear programming, motion of particles, elasticity, stress-strain, vibration, and flow of liquids. No personalities are mentioned. References follow all but one article.

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SOV/5724

Problems of Mechanics; (Cont.)

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AVAILABLE: Library of Congress

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11-6-61

S/124/61/000/012/011/038
D237/D304

AUTHOR: Prokof'yev, V. A.

TITLE: Infinitely small forced waves in radiating barotropic medium

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 12, 1961, 25-26, abstract 12B130 (Uch. zap. MGU, 1961, no. 193, 93-130)

TEXT: A hydrodynamic theory is proposed of the spreading of plane harmonic waves of small amplitude in the barotropic medium with viscosity, thermal conductivity, irradiation and absorption of thermal radiation energy present. Calculation of irradiation is based here on the equation of radiation transfer and appears to be more complete than that of gas cooling in the compression wave by Newton's law of radiation and leads to deduction of the existence of two types of thermal waves together with the elastic viscous wave. All three types of waves exist simultaneously, but

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Infinitely small forced...

they arrive at the given point with various losses due to absorption by the medium. Also, they have different wavelengths and velocities. A full investigation of the basic parameters of these waves is given, over the full frequency range. The results of calculations are illustrated graphically. For the more important cases, simple numerical formulas are obtained. [Abstracter's note: Complete translation.]

Card 2/2

PROKOF'YEV, V.A.

Propagation of natural faint plane waves in a radiating viscous gas. (MIRA 14:8)
Vop.mekh. no.193:131-156 '61.
(Wave mechanics)

29110
S/020/61/140/005/005/022
B125/B138

24.4600

AUTHOR: Prokof'yev, V. A.

TITLE: Equations in relativistic radiation hydrodynamics

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1033-1036

TEXT: The author studies the radiation field of a moving gas within the special theory of relativity without the simplifications hitherto made in other papers (e. g., with respect to v/c linear approximations irrespective of gravity, slight deviations of radiation from the equilibrium radiation satisfying Kirchhoff's law, uniform motion of a gas, etc.). The radiation field of a medium stationary in relation to the reference system K^* (x_1^*, x_2^*, x_3^*, t) is expressed by the intensity $I^*_{\nu^*}(\vec{r}^*, t^*, \vec{l}^*)$ or by the function $n^*_{\nu^*}(\vec{r}^*, t^*, \vec{l}^*) = I^*_{\nu^*}/h\nu^*$ of the directional and frequency (energy) distribution of the photons. Here, $\vec{r}^*(x_1^*, x_2^*, x_3^*)$ are the coordinates, t^* is the time, $\vec{l}^*(l_1^*, l_2^*, l_3^*)$ is the unit vector along the beam. All quantities marked with an asterisk refer to the system at rest K^*.

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Equations in relativistic...

for the radiation (ds = line element along the direction of the beam; $\rho\eta_\nu$, $\rho\alpha_\nu$, $\rho\sigma_\nu$ = volume coefficients of radiation, absorption, and scattering; Ω = re-emission coefficient) is converted by a Lorentz transformation, to the form

$$\left\{\frac{1}{c}\frac{\partial}{\partial t}+\left[l_\alpha^*+(\theta-1)\frac{l_\beta^* v_\beta}{v^2}v_\alpha+\theta\beta_\alpha\right]\frac{\partial}{\partial x_\alpha}\right\} I_{\nu^*}^*\theta^3(1+l_\alpha^*\beta_\alpha)^3 =$$

$$=\left\{(p\eta_\nu)^*+\int_0^\infty\frac{(p\sigma_{\nu'})^*}{4\pi}\int_{4\pi}I_{\nu'^*}^*\Omega^*d\nu'^*d\omega'^*-[(p\alpha_\nu)^*+(p\sigma_\nu)^*]I_{\nu^*}^*\right\}\theta^2(1+l_\alpha^*\beta_\alpha^*)^2. \quad (7)$$

applicable to the laboratory system. For a physical system consisting of an ideal liquid (in the absence of external forces) and a radiation field (photon gas), the laws of conservation of energy, momentum, and number of particles $\partial T_{rs}/\partial x_s = 0$, $\partial (nu^i)/\partial x^i = 0$ (8), together with the equation for the photon number, the transport equation (7) for radiation, and the equations of state, constitute the system of equations for relativistic hydrodynamics. Here, nu^i is the four-vector of the particle flux, u^i is the four-velocity ($u_\alpha = \theta v_\alpha/c$, $u_4 = i\theta$). The energy-momentum tensor T_{rs}

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Equations in relativistic...

is composed of the energy-momentum tensor R_{rs} of the photon gas and the energy-momentum tensor $\tau_{rs} = wu_r u_s + p\delta_{rs}$ of the liquid, $w = e + p$ is the thermal function, and $e = \rho c^2 + \rho U$ the internal energy of the specific volume of the liquid. ρc^2 denotes the residual rest energy, and ρ the residual density of the mass at rest. Under these conditions, the system of equations for relativistic hydrodynamics reads

$$\frac{d\rho}{dt} + p\,\mathrm{div}\,\mathbf{v} + \frac{\rho\theta^2}{c^2} v_\alpha \frac{dv_\alpha}{dt} = 0,$$

$$pR\theta \frac{dv_\alpha}{dt} + p\theta v_\alpha \frac{dR}{dt} + \frac{\partial p}{\partial x_\alpha} - \frac{\partial \pi_{\alpha\beta}}{\partial x_\beta} + \frac{1}{c^2}\frac{\partial H_\alpha}{\partial t} = 0,$$

$$R = \theta\left(1 + \frac{U}{c^2} + \frac{p}{\rho c^2}\right), \qquad (12)$$

$$p\frac{dU}{dt} - \frac{p}{\rho\theta}\frac{d(\rho\theta)}{dt} + v_\alpha\left(\frac{\partial \pi_{\alpha\beta}}{\partial x_\beta} - \frac{1}{c^2}\frac{\partial H_\alpha}{\partial t}\right) + \frac{1}{\theta^2}\left(\frac{\partial \varepsilon}{\partial t} + \frac{\partial H_\alpha}{\partial x_\alpha}\right) - \rho\theta v^2 \frac{dR}{dt} = 0.$$

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Equations in relativistic...

hence, the system of equations

$$\frac{d\rho}{dt} + \rho \operatorname{div} \mathbf{v} + \frac{\rho}{c^2} v_\alpha \frac{dv_\alpha}{dt} = 0,$$

$$\rho \frac{dv_\alpha}{dt} + \frac{\partial p}{\partial x_\alpha} - \frac{\partial \pi_{\alpha\beta}}{\partial x_\beta} + \frac{1}{c^2} \frac{\partial H_\alpha}{\partial t} + \frac{\rho}{c^2} \frac{d}{dt}\left[\left(\frac{v^2}{2} + U + \frac{p}{\rho}\right) v_\alpha\right] = 0, \quad (13)$$

$$\rho \frac{dU}{dt} - \frac{p}{\rho} \frac{d\rho}{dt} + \frac{\partial H_\alpha}{\partial x_\alpha} + \frac{\partial \varepsilon}{\partial t} + v_\alpha \frac{\partial \pi_{\alpha\beta}}{\partial x_\beta} - \frac{v_\alpha}{c^2} \frac{\partial H_\alpha}{\partial t} -$$

$$- \frac{v^2}{c^2}\left[\frac{\rho}{2} \frac{dU}{dt} + v_\alpha \frac{\partial p}{\partial x_\alpha} + \rho\left(1 - \frac{p}{\rho v^2}\right) v_\alpha \frac{dv_\alpha}{dt} - v_\alpha \frac{\partial \pi_{\alpha\beta}}{\partial x_\beta} + \frac{v_\alpha}{c^2} \frac{\partial H_\alpha}{\partial t}\right] = 0.$$

follows, if $v/c \ll 1$, and if the terms of the order v^2/c^2 are maintained. Since the density of the radiation momentum reads $\vec{S} = \vec{H}/c^2$, the terms with $v^2\vec{H}/c^4$ are also maintained; here, the characteristic radiation parameters in the laboratory system are taken. The radiation parameters have the form

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Equations in relativistic ...

in the system at rest. Also for the nonrelativistic limiting case, the radiation parameters are given in the laboratory system, and the radiation functions in the system at rest.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: May 18, 1961, by L. I. Sedov, Academician

SUBMITTED: March 10, 196:

Card7/7

ACCESSION NR: AP4005192 S/0207/63/000/006/0042/0049

AUTHOR: Prokof'yev, V. A. (Moscow)

TITLE: Damping of weak waves in radiating gas

SOURCE: Zhurnal prikl. mekhan. i tekhn. fiz., no. 6, 1963, 42-49

TOPIC TAGS: radiating gas, gas dynamics, energy transfer, optical damping

ABSTRACT: In a previous work by the author (Skorost' slaby*kh voln v izluchayushch-em gaze. PMTF, 1963, No. 3, str. 11-19) he used relativistic radiation hydrodynamics and nonviscous and nonheat conducting gas flow properties to obtain a frequency equation for certain applications to illustrate the damping and dispersion process in pressure waves. The roots of this equation are discussed in this paper. The wave absorption coefficient α_a^0 along relative sound wavelength l_0, the true absorption coefficient α_a along wavelength l, the absorption coefficient α_T on the radiation mean free path $1/\omega_0$, and the absorption coefficient α_a^1 along the unit length are calculated for large and small optical wavelengths where

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ACCESSION NR: AP4005192

$$\alpha_a^0 = 2\pi |m_r|, \quad \alpha_\tau = |m_r| v, \quad \alpha_a^1 = \alpha_\tau \omega_0 = \omega |m_r| / c_0,$$

$$\alpha_a = 2\pi a_1 = 2\pi \frac{m_r}{m_1}, \quad l_0 = \frac{2\pi c_0}{\omega}, \quad l = \frac{2\pi c_a}{\omega}$$

As an example, a solution is given for small optical wavelengths $v_{ij} >> 1$ where α_a^1 is shown to be independent of the frequency; α_a^0 and α_a are inversely proportional to the frequency, and all three damping coefficients depend on the optical coefficient through the parameter ω (1). Calculations are extended to the isothermal wave, and it is shown that the damping coefficient is a complicated function of the oscillation frequency in the wave. Orig. art. has: 42 equations.

ASSOCIATION: none

SUBMITTED: 30Mar63 DATE ACQ: 09Jan64 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 002

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L 42320-66 EWT(1)/EWP(m)/EWT(m)/EWP(w) IJP(c) WW/EM

ACC NR: AP6021353 SOURCE CODE: UR/0207/66/000/003/0008/0016

AUTHOR: Prokof'yev, V. A. (Moscow)

ORG: none

TITLE: Damping of plane forced weak pressure waves in gases by the effect of radiative heat transfer

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1966, 8-16

TOPIC TAGS: vibration damping, weak shock wave, radiative heat transfer, gas mechanics

ABSTRACT: The one-dimensional plane wave motion of a compressible fluid, taking into account the influx of heat due to absorption and radiation of the radiational energy, is described by a system of equations of the gas dynamics of an irradiated gas, including the equations for the transfer of momentum, mass, energy, and radiation, as well as the equation of state.

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L 42320-66

ACC NR: AP6021353

$$\frac{du}{dt} = -\frac{1}{\rho}\frac{\partial p}{\partial x}, \quad \frac{d\rho}{dt} = -\rho\frac{\partial u}{\partial x}, \quad \frac{dU}{dt} = -\frac{1}{\rho}\left(p\frac{\partial u}{\partial x} + \frac{\partial H}{\partial x}\right)$$

$$\cos\vartheta\frac{\partial J}{\partial x} = \omega(B - J), \quad U = \varphi(\rho, T), \quad p = f(\rho, T), \quad B = \frac{\eta}{\alpha} = \frac{\sigma'}{\pi}T^4 \quad (1.1)$$

$$H(x, t) = 2\pi\int_0^{\pi} J(x, t, \vartheta)\cos\vartheta\sin\vartheta d\vartheta, \qquad \omega \equiv \rho\alpha$$

Here p, ρ, T, u are the pressure, density, temperature, and velocity of the liquid; x, t are the coordinate and the time; U is the density of the internal heat energy; J is the integral intensity of the radiation; ϑ is the angle between the ray along which the radiative energy is transmitted and the x axis; H is the radiation flux; α is the mass coefficient of radiation absorption; η is the integral radiation coefficient; σ' is the Stefan-Boltzman constant. All the functions entering into these equations are assumed continuous. The article proceeds to a mathematical solution of the stated problem on the above basis. Orig. art. has: 29 formulas and 5 figures.

SUB CODE: 20/ SUBM DATE: 25Oct65/ ORIG REF: 001/ OTH REF: 002

Card 2/2

PROKOF'YEV, V.A. (Moskva)

Damping of weak waves in a radiating gas. PMTF no. 6:42-49 N-D '63. (MIRA 17:7)

CHUDAKOV, K.P., kand. tekhn. nauk; PROKOF'YEV, V.A., inzh.

Problems of the technical and economic analysis of the repair of E-652 excavators. Mekh. stroi. 20 no.8:17-18 Ag '63. (MIRA 16:11)

PROKOF'YEV, V.A. (Moskva)

Velocity of weak waves in an emitting gas. PMTF no.3:11-19 My-Je '63.
(MIRA 16:9)
(Electromagnetic waves)

L 18539-63 EPF(n)-2/EWT(1)/BDS AFFTC/ASD/AFWL/IJP(C)/SSD Pu-4
ACCESSION NR: AP3002799 S/0207/63/000/003/0011/0019

AUTHOR: Prokof'yev, V. A. (Moscow)

TITLE: Velocity of weak waves in a radiating gas 60

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1963, 11-19

TOPIC TAGS: weak wave , wave , Doppler effect, propagation, relativity, relativistic effect

ABSTRACT: Starting with relativistic equations of radiational hydrodynamics[21] of a nonviscous and non-heat-conducting fluid, neglecting the effects of interaction of high energy particles (formation of pairs, meson fields, etc.), the author studies propagation of small planar harmonic perturbations in a resting medium at equilibrium with consideration of the characteristic radiational field giving rise to thermal emission and absorption of electromagnetic waves by the particles of the medium. There are no pre-imposed conditions of smallness of the relations of the speed of sound and the speed of light and radiational pressure to the pressure of the gas under which earlier research was carried out. Relativistic

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effects can be observed for small microscopic velocities of the motion of the medium when the microscopic velocities of the individual particles are close to the speed of light (very high temperatures). Various-valued parameters describing the radiational field in fixed and local systems of reference will be not only in terms having a factor $1/c^2$ (c is the speed of light) but also in terms containing 1/c, as a result of the Doppler effect and aberration. From the equations of hydrodynamics of nonviscous, non-heat-conducting, radiating, and radiation-energy-absorbing gas within the limits of the special theory of relativity, the author obtains a dispersion equation for the propagation of weak perturbations in resting gas. Formation of pairs, meson fields and other effects related to the interaction of high energy particles is everywhere neglected. It is assumed that the state of radiation is determined by Kierkhoff's law. None of these restrictions can be removed, but they do not pose any difficulties in generalizing the given theory to more general equations of the radiation state. The author establishes the existence of two limiting velocities of propagating waves: the adiabatic velocity of the sound of small particles and the adiabatic velocity of the sound of large frequencies. These results were obtained earlier by the author (Rasprostraneniye vy*nyzhdenny*kh ploskikh voln szhatiya maloy amplitudy* v vyazkom gaze s uchetom sobstvennogo radiatsionnogo polya. Izv, AN

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SSSR, OTN, Mekhanika i mashinostroyeniye, 1960, No. 2, str. 18-33) from non-relativistic equations of hydrodynamics of radiating gas of Jeans-Focht, where they did not consider the difference between their descriptions in fixed and natural systems of reference. Consideration of the latter circumstance allows the establishment of a correct formula ((5.1) in this paper) for the adiabatic velocity of high frequency waves (instead of formula (3.8) of the cited article). The author shows the possibility of propagation of waves of pressure with isothermal velocity of sound. He demonstrates the possibility of existence of waves of pressure alongside thermal radiational waves. Orig. art. has: 47 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 26Dec62 DATE ACQ: 16Jul63 ENCL: 00

SUB CODE: PH NO REF SOV: 010 OTHER: 009

Card 3/3

PROKOF'YEV, V.A.; ABKEVICH, P.L., red.izd-va; PEN'KOVA, S.A., tekhn. red.

[Materials on paleontological characteristics of Lower Permian sediments in the Volga-Ural region] Materialy k paleontologicheskoi kharakteristike nizhnepermskikh otlozhenii Volgo-Ural'skoi oblasti. Moskva, Gosgeoltekhizdat, 1963. 58 p. (MIRA 16:4)

(Volga-Ural region--Palenotology, Stratigraphic)

PROKOF'YEV, V.A.

Characteristics of upper Carboniferous spiriferids of the Samara Bend. Dokl. AN SSSR 140 no.5:1156-1158 O '61. (MIRA 15:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy neftyanoy institut. Predstavleno akademikom D.V.Nalivkinym.
(Samara Bend--Brachiopoda, Fossil)

PROKOF'YEV, V.A.

Equations of relativistic radiation hydrodynamics. Dokl. AN SSSR 140 no.5:1033-1036 O '61. (MIRA 15:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom L.I.Sedovym.
(Hydrodynamics)
(Differential equations)

PROKOF'YEV, V.A.

Forced infinitesimal waves in a radiating barotropic medium.
Vop.mekh. no.193:93-130 '61. (MIRA 14:8)
(Wave mechanics)

PROKOF'YEV, V.A.; MOROZOV, G.A., red.

[Industry of Novgorod Province in the seven-year plan] Promyshlennost' Novgorodskoi oblasti v semiletke. Novgorod, Knizhnaia red. gazety "Novgorodskaia pravda," 1960. 53 p. (MIRA 14:2)

(Novgorod Province--Industries)

L 60207-65
ACCESSION NR: AT5019611

of conversion of isoprene in various solvents decreased in the following sequence: pentane, hexane, heptane, isopentane, butane, octane, isooctane, and cyclohexane. Up to a certain conversion level the average molecular weight of polymer remains constant in all hydrocarbon solvents of normal structure and in cyclohexane. At

ASSOCIATION: none

SUBMITTED: 240ct64 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 000 OTHER: 004

Card 2/2

VINOGRADOV, Yu.M., inzh.; KIREYENKOV, V.K., inzh.; KRITS, B.O., inzh.; PROKOF'YEV, V.F.

Quick-response telemechanical system for data transmission by telephone lines. Mekh. i avtom. proizv. 19 no.7:43-47 Jl '65. (MIRA 18:9)

L 62973-65 EWT(d)/FSS-2/EEC(k)-2/EEC-4/EED-2/EWP(l) IJP(c) BB/GG

ACCESSION NR: AP5018529 UR/0118/65/000/007/0043/0047
658.284.011.56:681.14

AUTHOR: Vinogradov, Yu. M. (Engineer); Kireyenko, V. K. (Engineer); Krits, B. O. (Engineer); Prokof'yev, V. F. (Engineer)

TITLE: High-speed telemechanical system for data transmission on telephone lines

SOURCE: Mekhanizatsiya i avtomatizatsiya proizvodstva, no. 7, 1965, 43-47

TOPIC TAGS: data transmission, computer application, data processing system, production engineering, punched paper tape, punched card, telemetry

ABSTRACT: The authors describe a high-speed telemechanical system for transmission of information developed by TsNIIKA together with the special design office at the Vilnyus Computing Machine Plant. The system was designed to transmit large volumes of production type alphanumeric data to a central computer processing point. The input console consists of an RTA-50 teleprinter hooked to an IL-20 tape perforator

paper tape; there are provisions for correcting the data. Then the FSU-1 photo-

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ACCESSION NR: AP5018529

reader reads the data from the punched tape at a rate of 200 lines/second and feeds them to the telemetry transmitter (in the same cabinet), which transmits them in a standard telegraph code to the telemetry receiver at the processing point. At the latter station the data are fed through a buffer converter to a positional converter and position perforator assembly, where they are converted into alphanumeric code and transferred to punched cards at a rate of 100-120 cards/minute. The telemetry transmitter-receiver group also transmits start and stop commands and has error detecting and correcting features. The output of the telemetry receiver can also be fed directly into a suitable digital computer, such as the "Minsk-2". The Telemechanics Division of TsNIIKA has completed fabrication of experimental samples of attachments to the telemetry system to allow it to operate on municipal and industrial telephone lines, as well as private lines. The system with these attachments (BTI-F) employs phase modulation of the data and pulse-frequency modulation of commands. It has a rate of 1200 baud. Details on interconnections, operation, and performance of the BTI system are given. Orig. art. has: 2 tables, 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: DP

NO REF SOV: 000 OTHER: 000

Card 2/2

PROKOF'YEV, V. I.

PROKOF'YEV, V. I.: "Investigation of the operation of steel cables under conditions of assembly tension." Academy of Construction and Architecture USSR. Moscow, 1956. (Dissertation for the Degree of Candidate in Technical Sciences.)

Source: Knizhnaya letopis' No 40 1956 Moscow

PROKOF'YEV, V.I., inzhener.

On the effective carrying capacity of lifting and mounting ropes and their connections. Strei.prom.34 no.7:15-20 Jl '56. (MLRA 9:9)
(Wire-rope transportation)

Prokof'yev, V.I.

PROKOF'YEV, V.I., kand.tekhn.nauk.

Designing construction cables using the ultimate-strength method. Stroi.prom. 35 no.11:24-29 N '57. (MIRA 10:12)
(Cables)